KPDES FORM HQAA

Kentucky Pollutant Discharge Elimination System (KPDES)

High Quality Water Alternative Analysis

The Antidegradation Implementation Procedures outlined in 401 KAR 5:030, Section 1(3)(b)5 allows an applicant who does not accept the effluent limitations required by subparagraphs 2 and 3 of 5:030, Section 1(2)(b) to demonstrate to the satisfaction of the Environmental and Public Protection Cabinet that no technologically or economically feasible alternatives exist and that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the water is located. The approval of a POTW's regional facility plan pursuant to 401 KAR 5:006 shall demonstrate compliance with the alternatives analysis and socioeconomic demonstration for a regional facility. This demonstration shall also include this completed form and copies of any engineering reports, economic feasibility studies, or other supporting documentation

I. Permit Information

Facility Name:	ICG Knott County, LLC	**KPDES NO.:**	KYG046374
Address:	1021 Tori Drive	**County:**	Knott
City, State, Zip Code:	Hazard, KY 41701	**Receiving Water Name:**	Caney Fork

II. Alternatives Analysis - For each alternative below, discuss what options were considered and state why these options were not considered feasible.

1. **Discharge to other treatment facilities.** Indicate which treatment works have been considered and provide the reasons why discharge to these works is not feasible.

The proposed permit area is to be a new deep mine site. There are no existing treatment facilities for mine discharge or processing operations in this area. The Pippa Passes Wastewater Treatment Plant is a small facility located at the base of Lige Hollow on Route 899, about ½ mile from the mining operation. This facility is for residential sewage and light commercial/institutional use and would not have the capacity to handle stormwater runoff from the Lige Hollow mine site. Nevertheless, the total distance from the most distant sediment ponds to the treatment facility is 5,400 feet. At $15/foot (materials and pipe installation) and $10,000 for a pump station, piping the stormwater would incur capital costs of cost $91,000. Actual pumping costs would exceed $150,000 per year. Assuming $75/hour for a 500 gallon water truck and operator, two hours to load, travel, unload, and return to site, one truck can run 12 loads a day for a total of 6,000 gallons at $1,800. Assuming a flow of 2.5 cfs from Lige Hollow (based on field data and stream measurements), 216,000 cubic feet or 1,615,680 gallons are discharged per day requiring 270 trucks per day at a cost of $484,700/day.

2. **Use of other discharge locations.** Indicate what other discharge locations have been evaluated and the reasons why these locations are not feasible.

The project area is in a watershed that discharges to Caney Fork. Nearby streams including Oldhouse Creek, Onion Blade Branch, and Hollybush Creek are also tributaries to Caney Fork. Over the ridge west of the site are Long Fork and Nealy Branch. Since neither of these streams appear on the 303(d) list, they currently have the status of high quality. These streams discharge to Jones Fork, an impaired stream 2.4 miles away. At $15/foot (materials and pipe installation) and two $10,000 pumping stations, piping the mine stormwater to Jones Fork would cost approximately $210,080. Again annual costs would exceed $250,000. The previous question and answer showed that trucking is not an economical option.

II. Alternatives Analysis - continued

3. **Water reuse or recycle.** Provide information about opportunities for water reuse or recycle at this facility. If water reuse or recycle is not a feasible alternative at this facility, please indicate the reasons why.

The proposed permit is for a new deep mine. Since there is no coal processing facility proposed for this site, the applicant does not anticipate that wastewater will be generated at the site. The stormwater runoff collected in the sediment ponds may be used for dust suppression underground with the continuous miner; this requires 10-15 gallons/min. Assuming a flow of 2.5 cfs from Lige Hollow (based on field data and stream measurements), the discharge is more than 78 million cubic feet per year and the amount needed for dust suppression is less than 2% of the total. Another 1,000 gallons/day may be used for dust suppression on access and haul roads but this is less than 1% of the daily flow. Water may also be used for hydroseeding, but the limited amount used during the few hydroseeding operations is negligible. Water cannot be reused for land application on slopes that are greater than 6%; the permit area and the much of the surrounding offsite area are (1) not agricultural and (2) have slopes that exceed 6% which hinders water reuse for land application.

4. **Alternative process or treatment options.** Indicate what process or treatment options have been evaluated and provide the reasons they were not considered feasible.

Surface mining was considered as an alternative to underground mining. However, the 3,078 acres for proposed underground mining cannot be surface mined for several reasons: (1) almost 300 residences, schools, churches, cemeteries, etc. exist on the surface of the proposed area; (2) roads, electric lines, gas wells, and streams are located on the surface; (3) the mining company does not have surface rights; (4) the economic ratio of overburden to coal (e.g. 15:1 to 25:1) cannot be met over the large proposed mining area; (5) surface disturbance to over 3,000 acres would be detrimental to the environment and wildlife habitats.

There are numerous waste water treatment options currently available for the treatment and removal of settable solids from the effluent stream. These include, but are not limited to, reverse osmosis filtration systems, a system of thickeners and vacuum filters, sedimentation boxes, sedimentation ponds, sediment ditches, filter fabric fences, and straw bales.

In this application, diversion ditches, sediment fence, and sediment basins are generally the methods of choice when following regulatory and industry Best Management Practices.

The other mechanical methods are cost prohibitive and require additional site disturbance, power lines, increased operating costs, and are ill suited in application and in design to handle tremendous flow variances between base line flows and storm event flows. These modular turn key facilities will cost several hundred-thousand dollars to fabricate and place on site. Annual operating costs could exceed several tens of thousands of dollars.

II. Alternatives Analysis - continued

5. **On-site or subsurface disposal options.** Discuss the potential for on-site or subsurface disposal. If these options are not feasible, then please indicate the reasons why.

The following considerations were made for on-site or subsurface disposal. Again there is no proposed or anticipated wastewater generation from the deep mine site; the only treatments to be constructed are sediment ponds to control suspended solids associated with stormwater runoff.

Septic tanks: This type of system does not lend itself to the type of effluent associated with a mine operation. The typical septic system includes a sealed tank and on absorption field. The waste water moves through the septic tank and into the absorption field. From there the clarified waste water passes into the soil. At this point the waste water is treated by microbial action in the soil. It is critical that the absorption field is designed to provide a small even flow into the soil. Field size is based on the site soil characteristics and on the amount of waste water to be treated on a daily basis. Septic systems are not designed to handle large solids loads and will clog with a short period. As noted above septic tanks rely on a biological process to treat waste water, not on a mechanical process to remove solids.

Even if a series of septic tanks were designed to treat this storm run off, physical constraints would limit the application of septic tanks. A typical septic tank and absorption field system will require a foot print of 0.1 to 0.25 acres to provide adequate dilution and distribution time. This size system would treat approximately 250 to 300 gallons per day or the amount generated by a typical four person household. In this case the average daily flow of 216,000 cubic feet or 1,615,680 gallons per day would require 5,386 systems or a foot print of 538 acres. Even estimating a low $1,000/tank, the cost would be over $5 million. Another design constraint would be the thin soil horizons normally associated with this region.

Spray irrigation: As mentioned in the Kentucky permit form MPA-03, the terrain in this area is steep (greater than 10%) and is not suitable for agriculture or irrigation. Besides the water used for dust suppression underground onsite, irrigation is not feasible due to greater than 6% slope.

Subsurface injection: There are several old Hazard and Elkhorn deep mines near the proposed project area. All together, these cover an area of roughly 127 acres. Assuming 60% coal recovery and 4 foot void height, the void volume in these old mines is 305 acre-feet. Assuming a flow of 2.5 cfs from Lige Hollow (based on field data), the discharge is more than 78 million cubic feet per year. Even if 25% of this flow infiltrates upon subsurface injection, 59 million cubic feet remain with an equivalent volume of 1,357 acre-feet which is 4.5 times more per year than the old mines can contain.

6. **Evaluation of any other alternatives to lowering water quality.** Describe any other alternatives that were evaluated and provide the reasons why these alternatives were not feasible.

The alternative is not carrying out the proposed mining project. However, this alternative would result in the loss of approximately 100 mining and ancillary positions which are in jeopardy as operations at other facilities are completed. Approximately 2,500,000 tons of coal would be left in the ground which would otherwise be mined and contribute to severance tax revenue ($562,500/year) over the proposed five year mining period. If this project does not progress, there will not be tax revenue from the coal sales and there will be a decrease in the tax base due to the loss of jobs in the community.

III. Socioeconomic Demonstration

1. State the positive and beneficial effects of this facility on the existing environment or a public health problem.

   The proposed mining permit will have positive and beneficial effects on the existing environment. There has been pre-law mining within the proposed permit area which has left exposed highwalls. Following mining of the Amburgy seam, the pre-law Amburgy bench will be reclaimed and revegetated. This reclamation will create an edge effect in the revegetated area which is conducive to use by wildlife. Revegetation will provide food sources for wildlife and reduce sediment loads to streams thereby improving aquatic habitats. Additionally, the proposed basins will provide drainage and sediment control for pre-existing access roads to gas wells.

2. Describe this facility's effect on the employment of the area

   The proposed mining permit is for a deep mine in Lige Hollow which is expected to produce coal for the next five years at minimum. The mine site anticipates employing 50 to 75 miners. Approximately 25 ancillary positions such as truck drivers, vendors, and suppliers are likely to be needed. There is also a coal preparation plant offsite but within Knott County. This operation will sustain existing jobs in the region as jobs shift to this deep mine from other areas where operations are being completed. The anticipated median income for miners is approximately $50,000/year compared to a median county income of $20,373/year.

3. Describe how this facility will increase or avoid the decrease of area employment.

   As previously mentioned, this mining operation will sustain existing jobs in the region. Failure of this mining operation to progress would result in loss of jobs within the area. Not only would mining and mining support jobs be put at risk, but local businesses may experience a slowdown if this mining operation were not to proceed.

4. Describe the industrial or commercial benefits to the community, including the creation of jobs, the raising of additional revenues, the creation of new or additional tax bases.

   This deep mining operation will benefit the mining operator, the coal processing facility, local business, and the employees of each entity by sustaining jobs within the region. Production from the proposed deep mine is expected to exceed 250,000 tons per year during the five year (minimum) planned production period. The following calculations estimate a portion of the federal and state tax revenue from coal production based on a $50/ton selling price:

   a. Federal excise tax at $1.10/ton = $275,000/year
   b. Reclamation tax at $0.35/ton = $ 87,500/year
   c. KY severance tax at 4.5% of sales = $562,500/year

5. Describe any other economic or social benefits to the community.

   According to workforcekentucky.ky.gov, the unemployment rate in Knott County is 10.7% compared to 10.5% in the state and 9.1% in the United States as of May 2009. This mining operation will sustain jobs in the region to prevent an increase in the jobless rate. The median household income for the county was $20,373 (2000 census). This deep mining operation is expected to directly employ 50 to 75 miners and require 25 auxiliary positions. The jobs sustained through this mining operation will have a median yearly income of approximately $50,000. Based on this salary and Kentucky's income tax rate of 2% to 6%, the federal income tax paid per person is approximately $2,700. Federal income taxes per person are approximately $8,690. For payroll taxes, social security paid per individual is estimated to be $6,200 (employee + employer=12.4%) and Medicare is $1,450 (employee + employer=2.9%). Kentucky's corporate income tax is 4 to 8.25%. Additionally, communities will be economically benefitted by this project. Service stations, shopping areas, restaurants, etc., owned and operated locally will benefit from the nearby project.

III. Socioeconomic Demonstration - continued

	Yes	No
6. Will this project be likely to change median household income in the county?	☒	☐
7. Will this project likely change the market value of taxable property in the county?	☒	☐
8. Will this project increase or decrease revenues in the county? *(increase)*	☒	☐
9. Will any public buildings be affected by this system?	☐	☒

10. How many households will be *economically* or *socially* impacted by this project? **~100**

11. How will those households be *economically* or *socially* impacted? (For example, through creation of jobs, educational opportunities, or other social or economic benefits.)

The households that will be economically or socially impacted by this project are those of the workers who will either gain jobs or maintain their existing jobs within the region. Job types include miners and ancillary support positions such as truck drivers, vendors, and suppliers. Additionally, the communities will benefit from sustained economic revenue due to mining in the area. Socially, the project and sustained jobs should foster a sense of community and well-being among miners, their families, and the community as a whole.

	Yes	No
12. Does this project replace any other methods of sewage treatment to existing facilities? (If so describe how)	☐	☒

N/A

	Yes	No
13. Does this project treat any existing sources of pollution more effectively? (If so describe how.)	☒	☐

Reclamation and revegetation of the pre-law highwall will reduce sediment transport from this area. Additionally, drainage ditches and temporary sediment basins will control runoff and sediment from existing access routes to the site.

III. Socioeconomic Demonstration - continued

	Yes	No
14. Does this project eliminate any other sources of discharge or pollutants? (If so describe how.)	☒	☐

As previously stated, reclamation of the pre-law highwall will reduce sediment transport from this area due to filling, regrading, stabilization, and vegetation of areas which are currently exposed to the weather. Additionally, drainage ditches and temporary sediment basins will control runoff and sediment from existing access routes to the site.

15. How will the increase in production levels positively affect the socioeconomic condition of the area?

Production levels in the area will positively affect the socioeconomic condition of the area by sustaining approximately 100 mining and ancillary positions within the community. The operation will increase travel through nearby communities resulting in sustained or increased sales at local businesses. Approximately 1,250,000 tons of coal will be mined during the proposed five year period resulting in roughly $562,500/year from the KY severance tax. If this project does not progress, there will not be tax revenue from the coal sales and there will be a decrease in the tax base due to the loss of jobs in the community.

16. How will the increase in operational efficiency positively affect the socioeconomic condition of the area?

The progression of this project is imperative to sustaining jobs in this community. Coal sales will maintain if not increase tax revenue in the area. Reclamation of pre-law highwalls will decrease sediment loads to nearby streams and improve wildlife habitat at the site.

IV Certification: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name and Title:	**See enclosed signature certification**	**Telephone No.:**	( ) -
Signature:		**Date:**	

Kentucky Pollutant Discharge Elimination System (KPDES)
Instructions
KPDES Permit Application Supplemental Information

SECTION I – PERMITTEE INFORMATION

Facility Name:	Provide the name of the facility
Mailing Address, City, State, and Zip Code:	Provide the mailing address
KPDES No.:	Provide the KPDES permit number for the facility
County:	Indicate the county in which the facility is located
Receiving Water Name:	Indicate the water body into which the facility discharges or plans to discharge.

SECTION II – Alternatives Analysis

For each item, provide a synopsis of the evaluations that were performed. A successful demonstration will provide justifications as to why these alternatives were not consider viable.

Include appropriate supporting documentation.

SECTION III – Socioeconomic Demonstration

Answer yes or no as appropriate. Where indicated, provide a synopsis of the positive economic impacts that will result from this project. A successful demonstration will show why the lowering of water quality is necessary to accommodate important economic or social development in the area.

Include appropriate supporting documentation.

SECTION IV - CERTIFICATION

Name and Title:	Indicate the name and title of the person signing the form.
Telephone No.:	Provide the telephone number of the person signing the form.
Date:	Indicate the date that the form was signed.

This form is part of the permit application and must be signed as follows:

Corporation: by a principal executive officer of at least the level of vice president
Partnership or sole proprietorship: by a general partner or the proprietor respectively